An Essay
on the
# Human Teeth

Respectfully submitted to the
Faculty
of the

## Homoeopathic Medical College
of
Pennsylvania

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by

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of
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# The Human Teeth

Considered in relation to their Formation, Structure, Diseases, and as Predisposing and Exciting Causes of Disease.

The human teeth, placed as they are at the portal of the digestive system are organs of the greatest importance, whether considered in themselves as regards their formation, structure and diseases, or as a predisposing or exciting cause of morbific action in other parts of the system.

This importance was early acknowledged, as Herodotus tell us that at a period far antecedent to his day, the Egyptians confided the care of these organs to a particular class of people, and although he does not inform us in what this care consisted, it is reasonable to suppose that at that early day but little was really known concerning the human teeth.

Formation of the Teeth.

The teeth perhaps occupy a longer time in their formation, and development than any other organ or set of organs in the system, consisting of two sets the decidious, milk or temporary and the permanent teeth. Commencing at as early a period as the seventh week of utero gestation, and extending through infancy and adolescence, and often to a much later period in life before their development is fully completed.

In the embryo of seven weeks, according to the researches of Goodsir, the germs of the first decidious molars are to be observed in the form of a small papilla of an ovoid shape, at the eight week the papilla of the cuspidata, and at the ninth and tenth weeks those of the incisors and second molars appear in succession about the thirteenth week the papilla begin

to assume the shape of the future teeth they are to form.

About the fifth month of utero-gestation the Pulps begin to ossify, commencing on the cuting edge of the incisors, soon after ossification has began the enamel commences to be deposited. Of the formation of the cementum but little is at present known.

About the fourth month of uterine life nature commences preparations for the formation of the permanent set of teeth.

The teeth mostly make their appearance through the gums about the seventh month after birth, commencing with the front incisors, about the end of the second year the eruption of the temporary teeth is generally completed.

## The Structure of the Teeth.

The human teeth are composed of four distinct tissues or substances, Viz. the Enamel, Dentine, Cementum and Pulp. The enamel is found only on the crown or body of the tooth, The dentine, tooth bone or ivory forms the great mass of the tooth, The cementum covers the outside of the fang, and also covers the top of the pulp in the cavity. The pulp is the remains of the germ together with a nerve, artery and vein and according to some writers a lymphatic.

Till within a few years the teeth were supposed to be bones similar to those in other parts of the body, and therefore liable to precisely the same diseases, and by many are even so considered at the present day, but that this view is erroneous may be deduced from a number

of circumstances, as 1st difference in mode of formation, 2nd of structure, 3rd of chemical composition, and a number of others which I shall briefly notice. 1st In regard to the difference in formation, bones are formed from cells constituting cartilage in which the osseous deposit takes place, The teeth have their origin from papilla, which perhaps in no part of the stage of transition to the fully formed tooth has the appearance of cartilage. 2nd The difference in structure, In examining the bones we find them to be composed of lamellæ between which are canals and minute oval corpuscles, and when examined under the microscope, is found to consist of tubuli. In teeth the dentine or tooth bone is a hard dense structure, and under microscopic examination is found to be composed of fibres, forming an irregular

net work which is filled with cells. (Nasmyth)

3rd. The difference in chemical composition,

According to Brezelius the composition of bone,

enamel and dentine are as follows. Viz.

| Bone. | | Dentine or Tooth Bone | |
|---|---|---|---|
| Cartilage . . . | 32.17 | Gelatine & Water. | 28. |
| Blood Vessels . . | 1.13 | Phos. of Lime . | 62 |
| Phos. of Lime . . | 51.04 | Carb. " " . . | 3.3 |
| Carb. " " . . . | 11.30 | Fluate " " . . | 2. |
| Fluate " " . . . | 2.00 | Phos. Magnesia . | 1. |
| Phos. Magnesia . | 1.16 | Soda, Muriate Soda. | 1.5 |
| Soda, Chloride Sodium | 1.20 | | |

| Enamel. . | | Cementum | |
|---|---|---|---|
| Phos. of Lime . | 85.3 | Phos. of Lime . | 53.84 |
| Carb. " " . . | 8. | Carb. " " . . | 3.98 |
| Fluate " " . . | 3.2 | Animal Matter. | 42.18 |
| Phos. " Magnesia. | 1.5 | Analysis by | |
| Soda, Muriate Soda. | 1. | Lassaigne. | |
| Animal Matter & Water | 1. | | |

It will be clearly seen from a comparison of these analysis, that the teeth and bones are essentially different in their chemical composition, with the exception of the cementum which approaches very nearly to bone, this is further confirmed by the fact that while bone may be destroyed and is again reproduced, the substance of the enamel and dentine never is, and often in cases where the teeth are gradually worn down, by mastication and sometimes from other causes whereby the pulp would be exposed and thereby give rise to great difficulty we find that the cementum in the upper part of the pulp cavity is gradually increased, till sometimes the whole cavity is entirely obliterated.

## Diseases of the Teeth.

All of the tissues of the teeth are liable to disease, some forms peculiar to themselves and others similar to those attacking the bones.

The first of these commencing with the external surface is caries or decay, and from its mode of action may be said to be peculiar to the teeth. The cause of this frequent and distructive disease is still a disputed question, almost every writer on the subject giving a different theory as to its origin. Fox in his celebrated work on the teeth, says, "Decay of the teeth is often the consequence of certain states of the constitution in which the functions are performed irregularly inducing various dyspeptic symptoms." Bell, defines it as "Mortification of any

part of a tooth, producing gradual decomposition", he also names the disease "gangrene". Jourdain and most of the French writers ascribe the origen to chemical causes, and also to certain states of the general health.

In regard to these different theories it appears to me that Foy has taken the ~~cause~~ effect produced by decayed teeth as the cause of their decay. Bell looked on the teeth as simple bones, and therefore liable to precisely the same diseases. The French writers perhaps have come nearer the true cause, but they too seem to have mingled cause and effect, their theory is also open to other objections.

By the student of Homoeopathy the cause of caries may be viewed in a different light, May not it as well as other diseases spring from some taint in the system of

the mother, during utero gestation while the teeth are forming of the offspring, either transmitted or acquired. Touching this point, it may be observed that the teeth of all the members of a family will often be either good, or else apt to become affected by caries, and often they can trace back the same type of teeth for several generations.

In other families where there is a difference in the type of teeth in the parents, it will be found that the children's teeth resemble those of the parent whom their general appearance favors, thus seeming as if the type or nature of the teeth was hereditary. It may also be stated in this connection, that severe attacks of sickness, in the mother during pregnacy often affects the teeth of the foetus in such a manner that the period of utero-gestation in which the sickness occured

can be told from the teeth of the child.

At present the only curative means is chief means to prevent. an extension of the disease is filling the cavity. filling does not cure but if as sciencs advances it should be discovered that the cause is some taint in the system, then Homeopathy may come in as a valuable adjuvant.

The next disease I shall notice is Odontalgia or Tooth Ache. The causes of this painful and distressing affection are numerous, among which may be mentioned caries, diseases of the pulp, cold and sympathetically, from pregnacy and diseases of the stomach, here a knowledge of the Heaven born law, "Similia Similibus Curantur". is of great advantage to the dentist, as by the administration of appropiate remedies much suffering may be prevented and many a tooth saved for future usefulness, which would otherwise be sacrificed.

Exostosis. This is a disease affecting the fang, and is similar to that of the same name attacking the bones, being a bony deposite, mostly commencing at the bottom of the fang, but all parts are liable to the deposite. The presence of this disease is made known by a sense of pressure in the socket and also soreness in the tooth. When the deposite is large it may give rise to pains which may be taken for neuralgia.

The cause of this disease is not a settled point, although most writers attribute it to inflamation of the periosteum. The only remedy at present is extraction of the tooth if it becomes painful. As it resembles the disease in bone, perhaps the same remedies of our school might prevent the enlargement or possibly remove the deposite itself.

Necrosis. By this term, applied to disease of the teeth is understood the death of the entire tooth or only of the crown and internal part of the fang, the periosteum keeping up a limited vitality in the external walls of the fang. In this disease, which also affects the bones we have another argument in favor of the opinion that teeth are not bones, as when the bones are affected the dead part separates and is thrown off, while the tooth may remain in its socket for years without any signs of exfoliation, the only change observable being a darking of the crown, among the causes may be mentioned caries, mechanical injury, and mercurial medicines.

Besides these diseases affecting the solid structures of the teeth, the pulp is also liable to take on diseased action, the

most common forms of which are inflammation and fungus growth.

Inflammation of the Pulp. The causes of this disease are caries and irritants of any nature acting on it, the pain at first is slight, but increases and assumes a throbing character, and if ~~[illegible]~~ the disease is not arrested suppuration of the pulp takes place and alveolar abcess follows.

Fungus growth of the pulp is most common in the molar and bicuspid teeth. after the greater part of the crown has been destroyed by caries, the fungus ~~[illegible]~~ or tumor is exceedingly vascular, and varies in size from an elderberry to that of a large pea. The larger ones are generally more vascular and possess but little sensibility, while the smaller ones are less vascular but very sensitive, sometimes as much so as the pulp

itself in a healthy state. The only cure is extraction of the tooth.

Inflammation of the Periosteum. This disease may arise from many causes, as the accumulation of tartar, dead tooth, cold, mercurial medicines, and mechanical injury; it often occasions intense pain, and if not arrested may give rise to necrosis of the alveolar processes and also of the maxillary bones, especially in those affected with a scrofulus, venereal or other taint.

Salivary Calculus or Tartar. This is a calcareous deposit mixed with remains of the food, and fastening itself to the teeth, sometimes confining itself to the crown near the neck and is small in quantity, in other cases the quantity is greater, covering the side of the tooth with a thick scale or crust, sometimes

it increases to such an extent as to envelope the whole crown, and one case is recorded by Prof. Harris, in his work on Dental Surgery, in which not only the crown but also the fang of an inferior dens sapientiæ had become imbeded in a solid mass of tartar, measuring 1⅛ inches in its longest diameter, its shortest ⅞ of an inch and in thickness ⅝ of an inch.

Of salivary calculus there are several varieties, as the black, brown, yellow, white, and green. Of these the black is the most harmless, the deposits being small, and mostly in a line or ridge near the neck of the tooth, it is very hard and is never found except in those possessing a good constitution. There is however a second variety of the black tartar which is very injurious, the deposits is greater than

the first, the appearance is also rough, it is found on the teeth of those whose constitutions, though originally good, have been broken down by disease & debauchery

Of the remaining varieties, as they lighten in color their pernicious qualities increase, the deposit also becomes softer in consistence and the odor given off is more offensive.

The largest secretions are generally found on the labial surface of the superior molars, and the lingual or buccal surface of the inferior incisors and cuspidata, these parts being opposite to the mouths of the salivary ducts.

The effects of salivary calculus on the teeth and gums are many and deleterious in their nature. In the gums producing imflamation, morbid growth and

absorbtion. ~~in~~ The teeth become loosened by absorbtion of the alveola, tenderness of the fang and inflamation of the periosteum is also induced. Often when the deposite has been accumulating for a long time, the teeth drop out in a perfectly sound condition.

The cause of the deposite is a disputed question. Fox, Bell and most of the English and American writers ascribe it to the saliva. The French writers have several theories, that of Jourdain is that the secretion takes place from small glands on the periosteum of the teeth. Delabarre ascribes it to ephalations from the mucus membrane of the gums.

Of these theories that that it arises from the salivary ducts is the most plausable, but that the deposite has

mixed with it decayed particles from the food is very probable.

The deposit may to a great extent be prevented by proper attention to cleaning the teeth, but when it has accumulated the only resource remedy is removal by means of proper instruments. Perhaps where the predisposition to its secretion is very great and it cannot be prevented from accumulating by the use of the brush and dentifrice, the administration of homoeopathic remedies, to act on the salivary glands or constitutionally would remove the predisposition to its formation.

Alveolar Abcess. This is a disease developing itself at the extremity of the fang in the socket. The most frequent cause is caries, but it also arises from cold, inflam-

ation of the pulp or periosteum &c. The matter secreted is confined in a sac formed by an exudation of plastic lymph and which fastens itself to the tooth. As the matter accumulates the alveola become absorbed by the pressure, a throbing pain can now be felt through the gum which becomes red and swollen, in a short time unless the abcess is opened the matter evacuates itself though the gums. This is the most general mode of discharge, but some times the matter finds its way though the integument of the face, especially where poultices are applied to hasten suppuration. When the opening is external, if the cause is in the inferior maxilary it is mostly at some part of the base of the jaw, when the disease arises in the teeth of the superior maxilary, the pus may find its way over the palate and be discharged into the throat. or it

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~~or~~ it may by absorbtion of the palate bones form a tumor in the roof of the mouth, it may also in the case of the superior molars find its way into the antrum, and thus set up disease in the maxilary bones. When from any cause the opening of the abcess is through the integument, especially when the affected tooth is in the inferior maxilary the cure is very difficult and tedious, on account of the parts being continually bathed with saliva.

Another consequence of alveolar abcess where the cause is not removed is necrosis and exfoliation of the alveolar processes, and sometimes a portion of the maxilary bones. The only cure after the abcess has discharged is extraction of the affected tooth, as without this course is taken the disease is very apt to reappear from the slightest exciting cause presenting itself.

The Teeth as a Predisposing Cause of Disease

I shall now proceed to notice the teeth considered as a predisposing cause of disease in other parts of the system.

The teeth being placed as it were as sentinals at the entrance of the digestive apparatus, on becoming diseased are incapable of performing their duties in a proper manner, this may arise in several ways, first if the teeth are diseased in such a manner as to prevent mastication, except to a very limited extent, it follows as a matter of necessity that the food not having been properly prepared is not in the condition to be received into the stomach, but having entered, that organ undertakes to perform not only its own functions but also to do that which should have been done by the teeth, but as this is impossible as no organ can perform

the office of another whose functions are different, the defect continues, it thus follows that the chyme must be imperfect in its nature, as must also the chyle; this abnormal chyle goes to form the blood which is to nourish and build up the whole system, but as the material from which this blood is formed was imperfectly prepared in the first of the series of operations necessary to produce the change, and as it was impossible to remedy the defect in any after part of the operation the blood is imperfect in its formation and therefore unable fully to perform its office, so that the body built up by this imperfect blood is not altogether in a state of health, but evidently in a condition predisposed to take on disease.

But ~~as~~ I have here only looked

of the subject in one light, I shall now examine it in another, the consequences arising from which are perhaps more pernicious then those in the previous case

This is in relation to the deposition of tartar, and the presence of carious teeth where they are not in such a condition as to interfere with the process of mastication. Here the food on being introduced into the mouth and while being masticated becomes mixed with a portion of the tartar and also of the carious matter, so that when the mass goes to the stomach it conveys a portion of poison intimately mixed with it, so that the chyme, chyle and blood formed are to an extent impure, and when this impure is taken in connection with the imperfect blood we see the body nourished by it is in a state still more pre-

disposed to take on diseased action then when only one of the evils exists.

The Teeth as an Exciting Cause of Disease.

I shall now proceed to notice the teeth as an exciting cause of disease in other parts of the system, and here perhaps the first idea to present itself to the mind in connection with the previous subject is, that if the teeth are in such a condition as to be unable to fully perform their functions and the stomach on receiving the imperfectly masticated food tries to remedy the defect, by so doing it overtaxes itself and weakness and debility of the organ. with all its attendant evils is thus induced.

I shall now examine briefly the effects produced on the gums by the teeth when in an unhealthy condition.

The gums being in close relationship with the teeth are often directly affected when these organs become diseased, thus we have scurvy, inflamation, morbid enlargements, so much so as at times to cover theen tire crowns of the teeth, tumors of various characters, which sometimes attain an enormous size, and in one case mentioned by Fox the tumor was so large as to push the teeth both upper and lower of the affected to the opposite side of the mouth, and also the nose to one side of the face, the size of the tumor was that of nearly half the head, the cause was ascribed to several diseased teeth.

Passing from the gums we find that the maxilary bones are often affected, from which the bones of the nose and face may also become affected. In the cheek and

chin we have fistulous openings, which are often almost impossible to cure, cases being mentioned by Fox and Bell which resisted both medical and surgical treatment for years.

The nerves of the teeth are from the fifth pair or trifacial which also supply the muscles of the face. In this connection we have that painful disease neuralgia or tic douloureux. We also find affections of the eyes arising from diseased teeth, sometimes even amounting to total loss of sight. In young infants perhaps teething is one of the most frequent causes of convulsions. Dyspepsia, headache and many other affections also doubtlessly often arise from diseased teeth.

In pregnant females we find toothache as one of the signs of that condition,

and as this is the case, may not the teeth by sympathetic action affect the uterine organs and thereby produce irregularities of various kinds in the menstrual discharge, or even go so far as to produce abortion itself?

There is still one class of diseases of great importance, in which the teeth when in an unhealthy condition doubtless act as a predisposing and also exciting cause. I refer to those of the respiratory system in their varied forms.

The teeth when in a diseased condition, either from caries or the accumulation of tartar are constantly giving off in the form of odor minute particles of decaying matter, in the act of inhalation this which is undoubtedly poisonous in its nature, is carried through the larynx and trachea into the lungs.

In passing, although the amount thus taken at each inhalation is small, still by acting as an irritant on the delicate membrane lining these passages, is it not probable that in the course of time the effect of this continual dropping as it were will be seen in inflammations cough &c? But more especially in those delicate organs the lungs is it not likely, nay is it not certain, that a poisoned atmosphere, so to speak being inhaled for a long time will show its effect in diseased action being set up, and thus be the exciting, if not the predisposing cause of many cases of that scourge of the human family consumption.

## Concluding Inferences.

In conclusion several inferences may be drawn from the preceeding remarks on the human teeth considered in their different aspects.

The first is that the study of these organs, though full of interest and of great importance as a branch of medical science has been much neglected by the medical world, leaving their study and the treatment of their diseases almost entirely to the dentist, while at the same time there are many points in the diseases of and arising from the teeth, which the medical practitioner who has not a knowledge of these organs is as unprepared to treat successfully, as is the practitioner of dental surgery who has not a knowledge of medicine, diseases in which, while they may fall to the lot of either for treatment, it is al-

most impossible to determine where the province of the dentist terminates or that of the physician commences, so intimately are the two branches blended.

The second inference I would draw, is that to the homoeopathic practicioner the teeth and their diseases should possess a special interest, as through the aid of the law Similia, many of their diseases which under allopathic treatment are incapable of cure may by the action of homoeopathic remedies be successfully treated. But to the young practicioner here is a wide field in which he may reap professional laurels, as much in regard to the teeth especially their pathology is still wraped in mystery and doubt, but much of which will be cleared away by the rising sun of homoeopathy shedding a new and brighter light on the ori-

gen of disease in general

The last inference to which I shall call attention, is that the teeth possess a greater importance in their own diseases and also as a cause of disease than is generally acknowledged, part of the reasons why their importance has not been conceeded are to be found in the fact that while medical men have paid but little attention to the subject, medicine and dentistry were considered as seperate and distinct branches of study, having little or no connection with each other, thus the dental practitioner knowing nothing of medicine was unable to examine into the origin of and curative means to be employed in diseases of the teeth, other then the filling of caries, but if too for destroyed for that operation or affected by other diseases the nature of which he did not understand, he then had recourse to his sheetan-

chor, the key or forceps, these he could fly to like many allopaths fly to their mercury and lancet when they know of nothing better, and perhaps the knight of the key was as successful as is he of the lancet, for as the latter often kills his patient to rid him of his ailment, the first always killed the tooth for the same purpose.

But a brighter day has began to dawn on dental science, the importance of a medical in connection with a dental education is more and more insisted on, and as the requisite qualifications are raised the members of the profession are becoming more liberal in their intercourse, and in all probability before many years have passed with such men as Goodsir, Nasmyth and Goddard entering the field, the true position of dentistry as a branch of medical science will

be fully acknowledged, and well will it be for the generations yet unborn, if as it advances it is joined with young homoeopathy as a companion in the time of need.

FINIS.